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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,957	04/12/2004	Takayuki Suzuki	Q80989	2365

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EXAMINER	
IVEY, ELIZABETH D	

ART UNIT	PAPER NUMBER
1775	

DATE MAILED: 06/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/821,957	SUZUKI, TAKAYUKI	
	Examiner	Art Unit	
	Elizabeth Ivey	1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 May 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) *3-7* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 2 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,810,925 to Tadatomo et al.

Regarding claims 1-2 and 8, Tadatomo discloses a semiconductor light emitting element comprising an epitaxial GaN single crystal having superior quality, sufficient luminescence, a half-maximum of the double –crystal X-ray rocking curve of 5-250 sec., which is less than 500sec and a thickness of not less than 80μm, sufficiently thick enough to permit its use as a substrate (abstract, column 1 lines 7-12 and column 2 lines 40-43, column 4 lines 38-41, and columns 9 and 10 Tables 1-2). Although Tadatomo does not expressly disclose an X-Ray

diffraction half width of less than or equal to 500 seconds at a {20-24} or {11-24} diffraction plane or a carrier density of less than 1x 10^{20} cm^{-3} or less, both would be inherent given the materials disclosed, the quality of the substrate and the luminescence achieved. Additionally, although Tadatomo does not expressly disclose a diameter of 10nm or more, it would have been obvious to a person having ordinary skill in the art at the time of the invention to adjust the diameter for the intended application because, where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. *In Re Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984) cert. denied, 469 U.S. 830, 225 USPQ 232 (1984)*.

Claims 1-2 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,040,588 to Koide et al.

Regarding claims 1-2 and 8, Koide '588 discloses a semiconductor light emitting element comprising nitride a semiconductor element including n-type and p-type and undoped layers and having a carrier concentration of 1-2 x $10^{17}cm^{-3}$ –2 x $10^{18}cm^{-3}$, which is less than 1 x $10^{20}cm^{-3}$ (abstract, column 1 line 65-column 2 line 14 and column 5 line 20 – column 6 line 15). Although Koide '588 does not expressly disclose an X-Ray diffraction half width of less than or equal to 500 seconds at a {20-24} or {11-24} diffraction plane or a carrier density of less than 1x 10^{20} cm^{-3} or less, both would be inherent given the materials disclosed, the quality of the substrate and the carrier density of less than 1x 10^{20} cm^{-3}. Additionally, although Koide '588

does not expressly disclose a diameter of 10nm or more, it would have been obvious to a person having ordinary skill in the art at the time of the invention to adjust the diameter for the intended application because, where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. *In Re Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984) cert. denied, 469 U.S. 830, 225 USPQ 232 (1984)*.

Claims 1-2 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,420,733 to Koide et al.

Regarding claims 1-2 and 8, Koide '733 discloses a semiconductor light emitting element comprising nitride a semiconductor element including n-type and p-type and undoped layers and having a carrier concentration of 1-2 x $10^{17}cm^{-3}$ –2 x $10^{18}cm^{-3}$, which is less than 1 x $10^{20}cm^{-3}$ (abstract, column 4 lines 33-51, column 5 lines 43-67 and column 9-10 claims 1-3). Although Koide '733 does not expressly disclose an X-Ray diffraction half width of less than or equal to 500 seconds at a {20-24} or {11-24} diffraction plane or a carrier density of less than 1x 10^{20} cm^{-3} or less, both would be inherent given the materials disclosed, the quality of the substrate and the carrier density of less than 1x 10^{20} cm^{-3}. Additionally, although Koide '733 does not expressly disclose a diameter of 10nm or more, it would have been obvious to a person having ordinary skill in the art at the time of the invention to adjust the diameter for the intended application because, where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions

would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. *In Re Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984) cert. denied, 469 U.S. 830, 225 USPQ 232 (1984)*.

Claims 1, 2 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,407,409 to Cho et al.

Regarding claims 1-2 and 8, Cho discloses a semiconductor light emitting element comprising an epitaxial nitride single crystal including n-type doping and having a carrier concentration of $1x\ 10^{18}cm^{-3}$, which is less than $1 \times 10^{20}cm^{-3}$ and a luminescence of 3.42eV (abstract, column 2 lines 64-66, column 3 lines 28-32, column 3 line 65 – column 4 line 12, column 6 lines 60-62 column 7 lines 8-20 and column 8 lines 9-12). Although Cho does not expressly disclose an X-Ray diffraction half width of less than or equal to 500 seconds at a {20-24} or {11-24} diffraction plane or a carrier density of less than $1x\ 10^{20}\ cm^{-3}$ or less, both would be inherent given the materials disclosed, the quality of the substrate, he luminescence and the carrier density of less than $1x10^{20}\ cm^{-3}$. Additionally, although Cho does not expressly disclose a diameter of 10nm or more, it would have been obvious to a person having ordinary skill in the art at the time of the invention to adjust the diameter for the intended application because, where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior

art device. *In Re Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984) cert. denied, 469 U.S. 830, 225 USPQ 232 (1984)*.

Response to Arguments

Applicant's arguments filed May 3, 2006 have been fully considered but they are not persuasive.

Examiner acknowledges applicant's affirmation of the restriction, election of Group I claims 1-2 and 8 and amendment to the specification and withdraws the objection to the specification.

Applicant's argument that the instant claims are distinguished over Tadatomo, because Tadatomo measures the diffraction half width of the crystal at the {0002} plane rather than the {20-24} or {11-24} plane is not sufficient. Tadatomo discloses undoped GaN (less than $10^{20}/cm^3$ carrier density) and a diffraction half width of far less than 500 and superior light emission. Because the structure of the disclosed article is the same as the claimed article, the fact that the half width is measured differently does not provide any structure or evidence that the claimed article is patentably different from the prior art.

Regarding both Koide references, Koide'733 and Koide'588 both discloses an n-type or p-type GaN single crystal with a carrier concentration less than $10^{20}/cm^3$ having high light efficiency and strong emission of light. Because the structure of the disclosed article is the same

as the claimed article, the fact that the half width is measured does not provide any structure or evidence that the claimed article is patentably different from the prior art.

Regarding Cho, Cho discloses an n-type freestanding GaN single crystal, 2 inches in diameter with a carrier concentration less than $10^{20}/cm^3$. Because the structure of the disclosed article is the same as the claimed article, the fact that the half width is measured does not provide any structure or evidence that the claimed article is patentably different from the prior art.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Ivey whose telephone number is (571) 272-8432. The examiner can normally be reached on 7:00- 4:30 M-Th and 7:00-3:30 alt. Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Elizabeth D. Ivey

JENNIFER C. MCNEIL
SUPERVISORY PATENT EXAMINER
6/15/06